

### **REMARKS/ARGUMENTS**

Reconsideration of the rejections set forth in the Office Action dated November 13, 2003 is respectfully requested.

Claims 1-4, 6-9, and 11-46 stand rejected. Claims 5 and 10 are objected to. Claim 47 is allowed. Claims 48-51 have been added. As such, claims 1-51 are currently pending.

New claim 48 recites a stage apparatus which includes a first stage coupled to a first actuator, and a first coupling arranged between the first stage and a second stage. The first coupling is arranged to apply a force to the second stage to substantially control acceleration of the second stage when the first actuator moves the first stage. Support for this new claim may be found throughout the Specification, as for example from page 11 at line 17 to page 13 at line 18. New claims 49 and 50 recite that the first coupling is an actuator. Support for these claims may be found, for instance, in the Specification from page 28 at line 17 to page 29 at line 20. New claim 51 requires that the first coupling is a first electromagnetic coupling, and also requires a second electromagnetic coupling. Support for these new claim may be found in the Specification, as for example from page 11 at line 17 to page 13, at line 18 and from page 28 at line 17 to page 29 at line 20.

### **Objections to the Claims**

Claims 5 and 10 have been objected to as being dependent upon a rejected base claim. The Examiner has indicated that claims 5 and 10 would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims. The Applicants have elected not to rewrite claims 5 and 10 in independent form at this time.

Rejections under 35 U.S.C. § 103

Claims 1-4, 6-9 and 11-46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Doran et al. (U.S. Patent No. 5,585,629) in view of Toshiya Asano (JP 2000223410).

The Applicants could not disagree more strongly with the Examiner's unsupported (and insistence that the Applicants have somehow made an admission that in a scanning apparatus, the use of two couplers is necessary for a scanning apparatus to function. **The Applicants have made no such statement at any time.** In fact, as the Applicants have repeatedly stated, the use of two couplers is not necessary for the scanning apparatuses of the cited art to function.

The Applicants are frustrated and sincerely puzzled as to why the Examiner continues to insist that the Applicants have admitted that in order for scanning to take place, two couplers are needed (Office Action dated November 13, 2003, page 5). Contrary to the Examiner's inaccurate understanding, the Applicant has never stated that two couplers are needed to perform scanning. The Applicants have stated that "The use of two couplers allows scanning, *e.g.*, acceleration of a first stage, in two directions along an axis to benefit from the use of the couplers (Specification, on from page 14 at line 27 to page 15 at line 3)." This is an inventive aspect of the present invention, and in no way have the Applicants made a generic statement that two couplers are needed for scanning to occur. If the Examiner can indeed point out exactly where and when such a statement about "need" was made by the Applicants, the Applicants would respectfully request that the Examiner bring such a statement to their attention. It is submitted that the term "allows" in no way implies an inherent need.

The Applicants state in the Specification that their inventive use of two couplers allows scanning to occur in two directions along an axis to benefit from the use of couplers. Hence, the inventive use of two couplers does indeed allow or permit scanning to occur, although contrary to the Examiner's repeated inaccurate statements, the use of two couplers is not needed or required

for any/every scanning apparatus to function. As such, the use of two couplers is not inherent to Asano, as argued by the Examiner.

If the Examiner believes that a statement such as “The use of two couplers allows scanning ...” somehow implies that the use of two couplers is necessary or required for a scanning apparatus to function, would the Examiner also argue that a statement such as “The use of a black pen allows an amendment to be signed ...” somehow implies that is necessary or inherent that an amendment be signed with a black pen? While it is true that one can sign an amendment with a black pen, one can also obviously sign an amendment with a blue pen. Similarly, while the inventive use of two couplers of the present invention allows scanning to occur, scanning can also occur using a single coupler (as taught by Asano, for example).

**The Examiner continues to repeatedly mischaracterize statements made in the Specification and in previous amendments, as the Applicants in no way even remotely implies that two couplers are *necessary* for any/every scanning apparatus to function.** On the contrary, none of the art of record teaches the use of two couplers. Hence, clearly, it is not necessary for scanning apparatuses to use two couplers.

**The Applicants note that even, solely for the sake of argument, if the statement “The use of two couplers allows scanning...” does somehow imply that two couplers are necessary for scanning (which is not believed by the Applicants to be the case), such a statement would apply only to the embodiments of the invention, as the statement “The use of two couplers allows scanning...” is made in the Detailed Description of the Embodiments section of the instant application.**

*1. Independent Claim 1 and its Dependents*

Independent claim 1 recites a scanning apparatus which includes a first stage and a second stage that are in contact with both a first coupler and a second coupler which are aligned

along the same axis. As stated above, on page 5 of the Office Action dated November 13, 2003, the Examiner has alleged that the Applicants stated in "Amendment A" dated July 16, 2002, that the use of two couplers is necessary for a scanning apparatus to function, and that since Asano discloses a scanning apparatus, the disclosure of Asano suggests multiple couplers. The use of two couplers is a feature of claim 1. At no point do the Applicants imply that every stage apparatus requires the use of two couplers, as the Applicants clearly state that the use of a first coupler and a second coupler aligned along the same axis is an inventive feature of claim 1. At no point in any previous amendments do the Applicants state that two couplers are needed in all scanning apparatuses. Contrary to the Examiner's assertions in the Office Action, the Applicants have made no admission that the invention of Asano would not work without at least two couplers. It is submitted that Asano only discloses the use of one coupler so, unless the stage disclosed by Asano is non-functional, the stage of Asano appears to function with the use of a single coupler.

Claim 1 requires a scanning apparatus with both a first coupler and a second coupler. Scanning in a first direction may allow the second stage to scan through the first coupler, and scanning in a second direction may allow the second stage to scan through the second coupler. Further, a first stage may accelerate in two directions along an axis due to the presence of two couplers.

It is respectfully submitted that the use of more than one coupler is neither shown nor remotely suggested by Asano (nor admitted by the Applicants as being necessary in all scanning apparatus, since the Applicants have made no such admission or statement in any previous amendments). As shown in Fig. 1 of Asano and as discussed in the corresponding description, Asano teaches of only a single spring element which couples a positioning stage with an acceleration/deceleration stage. Neither Doran et al. nor Asano, alone or in combination, teaches of or even reasonably suggests the use of more than one coupler. Therefore, claim 1 and each of its dependents are believed to be allowable over the art of record for at least this reason.

2. *Independent Claim 33 and its Dependents*

Like independent claim 1, independent claim 33 also requires the use of a first coupler and a second coupler and is, therefore, believed to be allowable over a combination of Doran et al. and Asano because Asano does not suggest the use of more than one coupler. The first coupler of claim 33 couples a first surface to a stage mechanism, and the second coupler couples a second surface to the stage mechanism. The first coupler is in a first state when the first stage mechanism moves along a first axis in a first direction, while the second coupler is in a second state. There is no teaching or suggestion in the art of record of using a first coupler and a second coupler which are in a first state and a second state, respectively, when a stage mechanism moves in a first direction.

With regards to claim 33, the Examiner has asserted on pages 5 and 6 of the Office Action that “couplers having different states is an inherent result of the obvious matter of design choice of locating the two couplers of Asano on opposite ends of a course stage.” As discussed above, the Applicants respectfully submit that Asano does not teach or reasonably suggest the use of more than one coupler. Hence, there is no “inherent result or an obvious matter of design choice” with regards to positioning two couplers, as Asano only teaches of one coupler. Again, the Applicants continue to be puzzled as to why the Examiner is still of the incorrect belief that the Applicants somehow believe that the use of two couplers is necessary for a scanning apparatus to function, as there are no statements made in either the instant application or previous amendments to this effect. Since neither Doran et al. nor Asano, alone or in combination, teach or even suggest using more than one coupler, claim 33 and its dependents are each believed to be allowable over the art of record for at least these reasons.

3. *Independent Claim 25 and its Dependents*

Independent claim 25 recites a scanning apparatus which includes a coarse stage and a fine stage which are effectively coupled using a first cord. The first cord has a relatively high

transmissibility and is substantially stiff when the coarse stage accelerates in a first direction along a first axis. When the coarse stage accelerates in a second direction along the first axis, the first cord is substantially slack and has a relatively low transmissibility. Hence, the stiffness of the first cord, along with the transmissibility, varies depending upon the direction in which acceleration occurs.

On page 6 of the Office Action, the Examiner has stated that Asano discloses the claimed invention except for stating that passive elements are cords, and that it would have been an obvious design choice to use a cord as a passive element. The Applicants respectfully submit that neither Doran et al. nor Asano, alone or in combination, teach of a coupler for which the stiffness or the transmissibility changes depending upon a direction or acceleration.

The Examiner's argument that the Applicants rely on "one of several embodiments of the invention of Asano, which teaches a rigid spring could be used to perform coupling between two stages" (Office Action, page 5) is inaccurate. The Applicants refer to a "spring element" because Asano uses the term "spring element" generically to refer to something that links stages (Asano, 0030). Asano teaches that a spring element can be a mechanical spring, a non-contacting item, a passive item, or an active item (Asano, 0030). Hence, the Applicants reference to a spring element is not a reference to one of several embodiments. In fact, such a reference is a reference to all embodiments taught by Asano.

Contrary to the Examiner's assertions, the Applicants submit that Asano does not teach of or suggest the use of a spring element that is a passive element like a cord between two stages. The cord is substantially slack (not rigid) during acceleration in a second direction, and the cord is substantially stiff (rigid) during acceleration in a first direction, as required by claim 25. Hence, the cord may have either a high rigidity or a low rigidity during acceleration, depending upon a direction of acceleration. In other words, a cord has characteristics which go against the teachings of Asano that during acceleration/deceleration, the rigidity of an element is always high (Asano, 0035) and, as such, it is respectfully submitted that not only does Asano not teach the limitations of claim 25, the coupler of Asano can not possibly be a cord. (The Applicants

once again note that Asano teaches that this element may be a mechanical spring, a non-contacting item, a passive item, or an active item (Asano, 0030), *i.e.*, the Applicants are not arguing only one embodiment and are instead referring to all embodiments taught by Asano.) Accordingly, claim 25 and its dependents are each believed to be allowable over the art of record for at least these reasons.

The Examiner has stated that Asano teaches of passive couplers. Although Asano appears to mention passive items (Asano, 0030), Asano does not explain what a passive item might be. The Examiner has stated on page 6 of the office action that a passive coupler implies low rigidity. Even assuming, *arguendo*, that the Examiner is correct in his assumption (which the Applicants do not believe to be the case), the Examiner has failed to show that a passive element of Asano has a low rigidity during acceleration in one direction and a high rigidity during acceleration in a second direction. As noted above, Asano specifically teaches during acceleration and deceleration, the rigidity on an element that couples stages is high (Asano, 0035). Hence, the element/coupler taught by Asano cannot be the same as the coupler of claim 25, since the rigidity of the coupler of claim 25 varies depending upon the direction in which acceleration occurs.

#### *4. Independent Claim 14 and its Dependents*

Independent claim 14 recites a scanning apparatus which includes a coarse stage and a fine stage which are effectively coupled using a first coupler. The first coupler has a relatively high transmissibility when the coarse stage scans in a first direction along a first axis, and a relatively low transmissibility when the coarse stage scans in a second direction along the first axis. It is respectfully submitted that the coupler of Asano is not a coupler for which the transmissibility changes depending upon a scanning direction. Asano specifically teaches that during acceleration/deceleration, it is preferable that the rigidity of a spring element (coupler) be high (Asano, 0035). Asano teaches against the rigidity of the spring element ever being low during acceleration/deceleration (scanning).

On page 6 of the Office Action, the Examiner has stated that Asano teaches that “the transmissibility of a coupler changes when the flexible volume changes *i.e.* the instant the course [sic.] stage changes direction of scanning.” This is not the case. The Examiner refers to Fig. 2, which according to Asano in his description of figures, is a plot of spring element rigidity and spring element flexible volume. Nothing in Fig. 2 appears to have a relationship to a scanning direction. Once again, the Applicants respectfully submit that there is no teaching or suggestion in any of the art of record, including Asano, that the transmissibility of a coupler changes from a high transmissibility to a low transmissibility depending upon the direction of scanning. While the rigidity of the coupler of Asano may change when a flexible volume changes (Asano, 0037), it is submitted that contrary to the Examiner’s assertions, there is no teaching or suggestion in Asano that the flexible volume of a coupler and the transmissibility of the coupler change the instant a coarse stage changes a direction of scanning.

It is respectfully submitted that Doran et al., in combination with Asano, does not teach that the rigidity of a spring element has a transmissibility that changes based on a direction in which a stage is scanned. Therefore, claim 14 and its dependents are all believed to be allowable over the art of record for at least this reason.

5. *Independent Claim 39 and its Dependents*

Independent claim 39 requires that a transmitter which is disposed between a first stage and a second stage transmits force between the first stage and the second stage when a driving device accelerates the first stage in a first direction. The transmitter does not transmit a force between the first stage and the second stage when the driving device accelerates the first stage in a second direction. Since Asano teaches of a single spring element (transmitter) which drives a positioning stage whenever an acceleration/deceleration stage accelerates (Asano, paragraphs 0034 and 0035), it is respectfully submitted that no combination of the art of record teaches of or suggests a transmitter which is arranged to transmit force when acceleration is occurring in one



direction along an axis, and not arranged to transmit force when acceleration is occurring in another direction along the axis, as required by claim 39. The Applicants respectfully submit that contrary to the Examiner's assertions in the Office Action, Asano does not teach of rigidity changing characteristics of couplers which are arranged to transmit force during acceleration in one direction and not arranged to transmit force during acceleration in another direction. Instead, Asano appears to teach that during acceleration in any direction, the rigidity of a spring element is high (Asano, paragraph 0035). Accordingly, claim 39 and its dependents are believed to be allowable over Doran et al. in view of Asano for at least this reason.

The Examiner has made an argument that use of passive couplers allows the claim limitations to be met (Office Action, page 7). The Applicants submit that Asano teaches that a spring element can be a mechanical spring, a non-contacting item, a passive item, or an active item (Asano, 0030). Hence, the Applicants reference to a spring element is not a reference to one of several embodiments. Asano specifically teaches that "spring element" also refers to a passive item, *i.e.*, the term "spring element" as used by Asano refers to all embodiments taught by Asano. Therefore, a passive coupler of Asano also has a high rigidity during acceleration in any direction, as Asano has described a spring element having a high rigidity during acceleration in any direction and that a spring element can be a passive item.

6. *Independent Claim 43 and its Dependents*

Independent claim 43 requires that when a first stage accelerates in a first direction along an axis, a transmitter causes a second stage to accelerate by transmitting a force between the first stage and the second stage. However, when the first stage accelerates in a second direction along the axis, the transmitter does not transmit force between the first stage and the second stage. As discussed above with respect to claim 39, none of the art of record teaches of a transmitter (*e.g.*, spring element) which transmits force when acceleration occurs in one direction along an axis, and does not transmit force when acceleration occurs in another direction along the axis. Asano specifically teaches that during acceleration, a drive force is conveyed via a spring element

(Asano, paragraph 0034), and does not teach of a drive force not being conveyed by the spring element during acceleration. As stated above, since Asano specifically teaches that "spring element" also refers to a passive item, it is respectfully submitted that there is no support for the Examiner's argument that passive couplers as taught by Asano somehow allow claim limitations to be met. Therefore, claim 43 and its dependents are believed to be allowable over the art of record for at least this reason.

In view of the above, the Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below. If any fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge such fees to Deposit Account 50-1652 (Order No. NRCAP003).

Respectfully submitted,



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